

REMARKS

In the Office Action, the Examiner rejected claims 1, 2 and 10-14 under 35 USC § 102(b); rejected claims 1-4, 12-16 and 18 under 35 USC § 102(e); and rejected claims 5, 6, 9, 17 and 20 under 35 USC § 103(a). These rejections are fully traversed below. In addition, the Examiner stated that claims 7, 8 and 19 contain allowable subject matter.

Claims 1-20 remain pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

REJECTION OF CLAIMS 1, 2, AND 10-14 UNDER 35 USC § 102(b)

In the Office Action, the Examiner rejected claims 1, 2 and 10-14 under 35 USC § 102(b). This rejection is fully traversed below.

Sasaki et al. describes a microphone apparatus that includes a first microphone for picking up a desired sound and a second microphone with directionality in which sensitivity is low to the desired sound arrival direction. A subtracting circuit subtracts a second sound signal from the second microphone after being filtered through an adaptive filter from the sound signal coming from the first microphone. The adaptive filter is adjusted so that the output power of the subtracting circuit is minimized.

In contrast, claim 1 pertains to an adaptive directional sound processing system. Although the adaptive directional sound processing system of claim 1 includes first and second microphones, the adaptive directional sound processing system operates to compensate for sensitivity differences between the first and second microphones. Specifically, claim 1 recites “means for processing the second electronic sound signal to adaptively produce a compensation scaling amount that compensates for sensitivity differences between said first and second microphones” (claim 1, lines 5-7).

Although the Examiner points to the adaptive filter 24 in Sasaki et al. as corresponding to such means, Applicant respectfully disagrees. The adaptive filter 24 utilized in Sasaki et al. is adjusted so that the output power from the subtracting circuit 15 is minimized. “In this system, when the output power of the subtracting means is minimized, the sound signal of the second microphone 21 is removed from the sound

signal of the first microphone 11, providing only a desired sound from the first microphone 11 as an output sound signal.” Sasaki et al., col. 2, lines 18-23.

Accordingly, the adaptive filter 24 is not used to compensate for sensitivity differences between the first and second microphones as is recited in claim 1. Therefore, it is submitted that claim 1 is patentably distinct from Sasaki et al. In addition, it is submitted that dependent claim 2 is also patentably distinct for at least the same reasons.

Claim 10 pertains to a hearing aid device having an adaptive directional sound processing. Among other things, the hearing aid device recited in claim 10 includes first and second microphones and sensitivity difference detection circuitry. The sensitivity difference detection circuitry “adaptively produces a compensation scaling amount corresponding to sensitivity differences between said first and second microphones” (claim 10, lines 6-9). For similar reasons to those noted above, Sasaki et al. fails to teach or suggest the sensitivity difference detection circuitry recited in claim 10. Therefore, it is submitted that claim 10 is patentably distinct from Sasaki et al. In addition, it is submitted that dependent claims 11-14 are also patentably distinct for at least the same reasons.

Based on the foregoing, it is respectfully requested that the Examiner withdraw the rejected of claims 1, 2 and 10-14 under 35 USC § 102(b).

REJECTION OF CLAIMS 1-4, 12-16 AND 18 UNDER 35 USC § 102(e)

In the Office Action, the Examiner rejected claims 1-4, 12-16 and 18 under 35 USC § 102(e) as being anticipated by Ikeda, U.S. Patent No. 6,285,768. This rejection is fully traversed below.

Ikeda describes a noise canceling method and noise canceling unit. The Examiner points to the adaptive filter 12 of the signal-to-noise power ratio estimation circuit 22 (see Fig. 1) as corresponding to the means for processing to compensate for sensitivity differences between first and second microphones as recited in claim 1. In Ikeda, the signal-to-noise power ratio estimation circuit 22 is used to set a step size for the adaptive filter 4 so that convergence speed can be controlled. As noted in Ikeda, an object was to “provide a noise canceling method and a noise canceling unit which perform SNR estimation correctly and speedily and which require less convergence

time, and generate a smaller after-convergence distortion (residual error), than the conventional method.” Ikeda, col. 7, lines 10-15. Accordingly, for similar reasons to those noted above, it is submitted that Ikeda also fails to teach or suggest the means for processing so as to compensate for a sensitivity difference between first and second microphones as recited in claim 1.

Therefore, it is submitted that claim 1 is patentably distinct from Ikeda. In addition, it is submitted that dependent claim 2 is also patentably distinct for at least the same reasons.

Claim 3 pertains to an adaptive directional sound processing system that includes, among other things, first and second microphones and first and second minimum estimate circuits. In the Office Action, the Examiner references power average circuits 14 and 15 at col. 4, lines 63-64 of Ikeda as corresponding to the first and second minimum estimate circuits. Applicants respectfully disagree. According to claim 3, “said first minimum estimate circuit produces a first minimum estimate for the first electronic sound signal from said first microphone” and “said second minimum estimate circuit produces a second minimum estimate for the second electronic sound signal from said second microphone.” The power average circuit 14 squares an error signal, and the power average circuit 15 squares a pseudo noise signal. Hence, the power signals from the power average circuits 14 and 15 are power signals not minimum estimates of sound signals from microphones. Therefore, it is submitted that claim 3 is patentably distinct from Ikeda. In addition, it is submitted that dependent claim 4 is also patentably distinct for at least the same reasons.

Claim 12 pertains to a method for adaptively measuring and compensating for acoustical differences between sound signals picked up by microphones. Again, Ikeda does not teach or suggest a solution for acoustical differences between sound signals picked up by different microphones. Ikeda is instead a noise canceling method by which noise signals can be removed from desired signals. Hence, among other things, claim 12 recites, “determining a compensation scaling amount that compensates for acoustic differences with respect to the first and second microphones” (claim 12, lines 5-6.) Nothing in Ikeda teaches or suggests compensating for acoustic differences with respect to first and second microphones. Therefore, it is submitted that claim 12 is patentably distinct from Ikeda. In addition, it is submitted that claims 13-16 and 18 are also patentably distinct for at least the same reasons.

Based on the foregoing, it is respectfully requested that the Examiner withdraw the rejected of claims 1-4, 12-16 and 18 under 35 USC § 102(e).

REJECTION OF CLAIMS 5, 6, 9, 17 AND 20 UNDER 35 USC § 103(a)

In the Office Action, the Examiner rejected claim 5 under 35 USC § 103(a) as being unpatentable over Ikeda in view of Vernon et al., U.S. Patent No. 6,268,725; rejected claim 6 under 35 USC § 103(a) as being unpatentable over Ikeda, in view of Coates (U.S. Patent No. 4,245,313); rejected claim 9 under 35 USC § 103(a) as being unpatentable over Ikeda in view of Greenburg ("Evaluation of an adaptive beam forming method for hearing aids," Journal of Acoustic Society America, 91(3), March 1992, pp. 1662-76); rejected claim 17 under 35 USC § 103(a) as being unpatentable over Ikeda in view of Thompson (U.S. Patent No. 6,654,468); and rejected claim 20 under 35 USC § 103(a) as being unpatentable over Sasaki et al. in view of Greenburg. These rejections are fully traversed below.

In the rejections under 35 USC § 103(a), the Examiner combines various of the above-noted primary references with the one or more of the secondary references of Greenburg, Thompson, Vernon et al. and Coates. However, none of these secondary references are able to overcome the above-noted deficiencies of the primary references. Hence, even if the secondary references were to be combined with the primary references in the manner proposed by the Examiner, the combination of these references would still be deficient in rendering any of the above-noted claims unpatentable. Therefore, it is respectfully requested that the Examiner withdraw the rejection to claims 5, 6, 9, 17 and 20 under 35 USC § 103(a).

SUMMARY

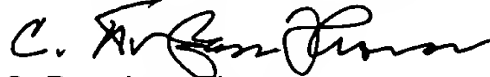
It is submitted that the above-noted rejections to claims 1-6, 9-18 and 20 should be withdrawn. Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. AUD1P005).

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP

A handwritten signature in black ink, appearing to read "C. Douglass Thomas", is written over the printed name.

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